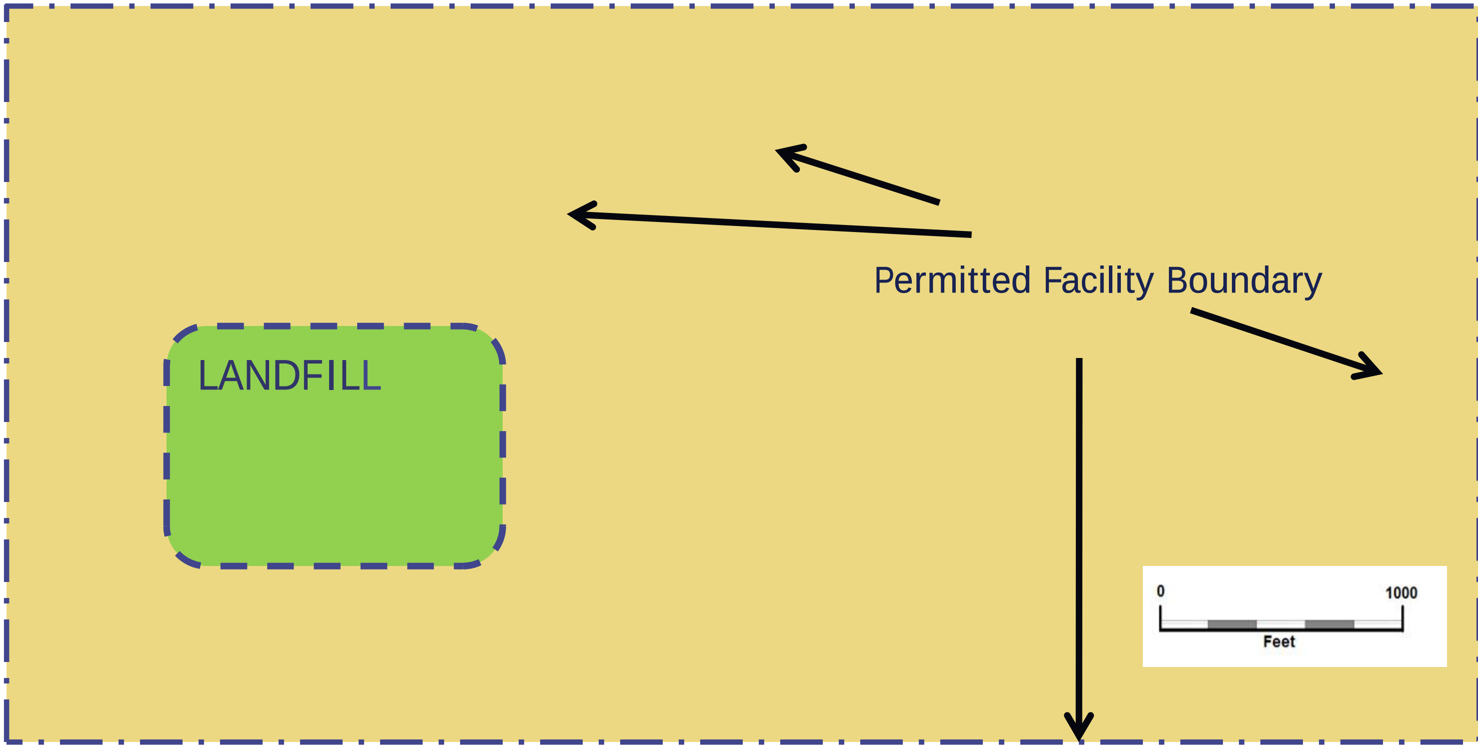
Exercise 1A: Well Location--Alternate Compliance Boundary

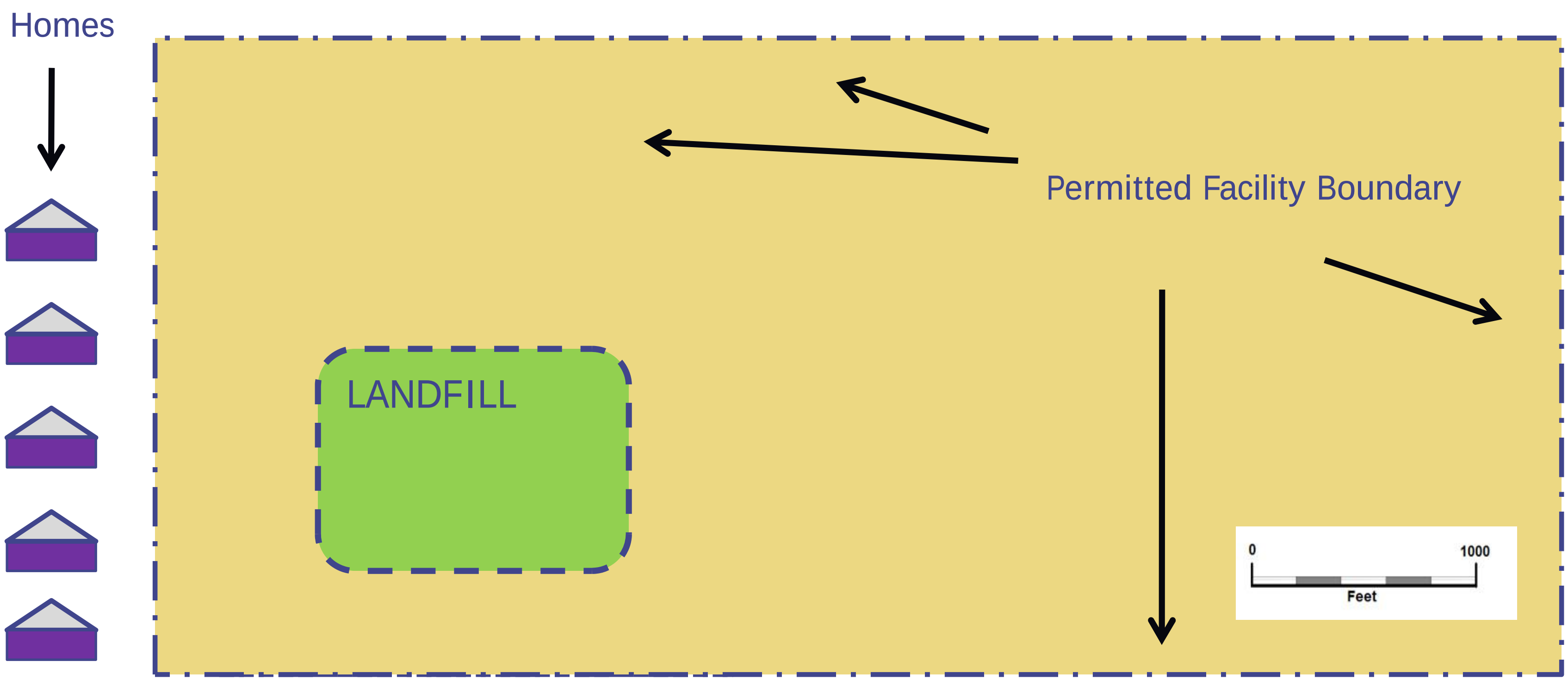


The above diagram is a plan view showing the waste footprint of a landfill within the permitted facility boundary.

EXERCISE: In some situations, the compliance boundary may not need to be at the permitted boundary and a smaller monitoring network may be sufficient. Design a LFG monitoring system using an alternate boundary consistent with state standards. Show locations of monitoring wells. Provide two reasons as to why an operator might chose this approach.

Note: ignore access issues, geographic features, geology and hydrology issues.

Exercise 1B: Well Location--Alternate Compliance Boundary with Nearby Structures

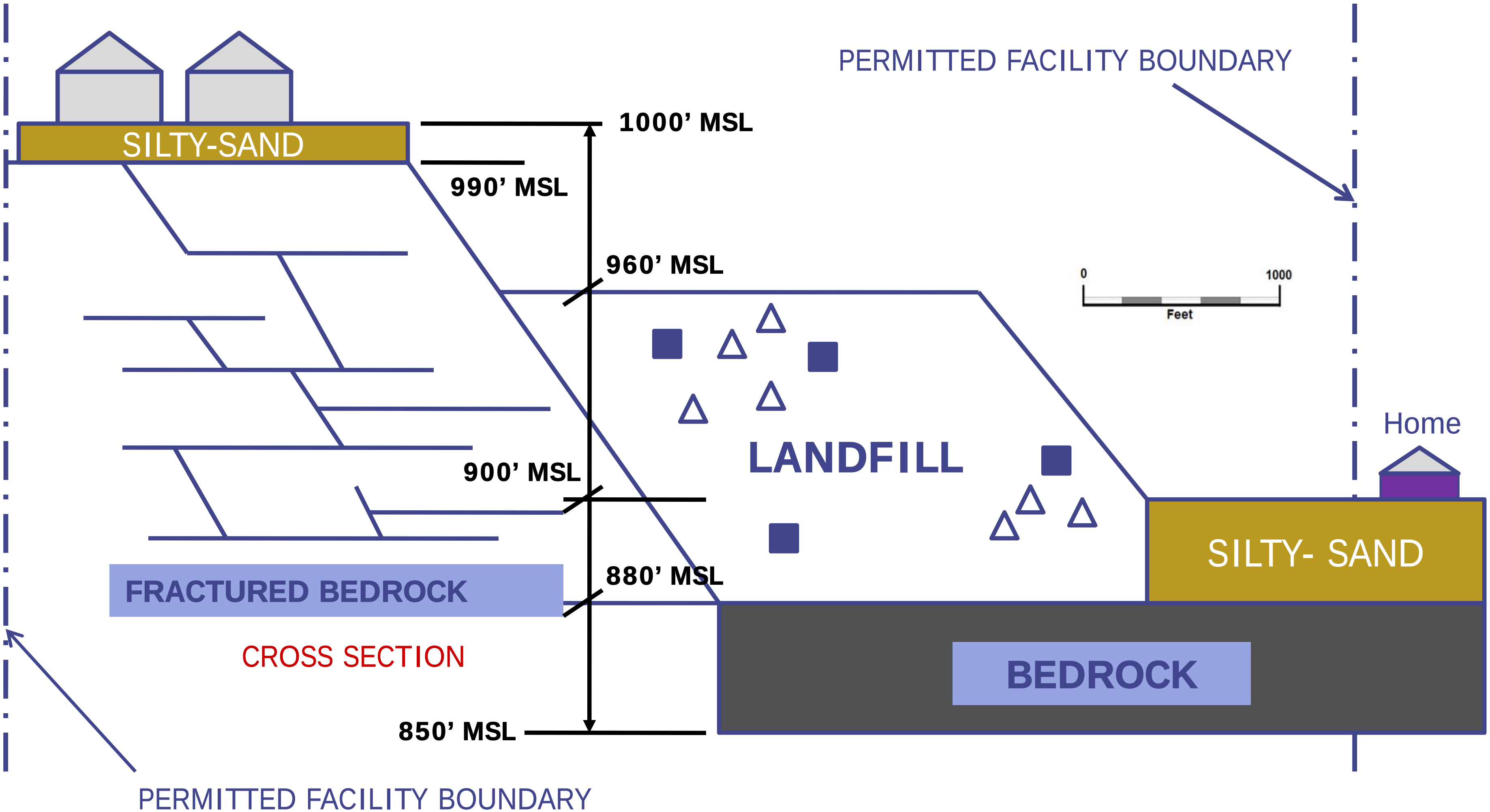


The above diagram is the same plan view from Exercise 1A except that there are houses located on near the left border of the permitted facility boundary, approximately 1000 feet from the waste footprint.

EXERCISE: Same scenario as Exercise 1A, but there are now homes adjacent to the permitted facility boundary. Would the alternate compliance boundary change? Would the number and locations of monitoring wells change? If yes, draw the new monitoring network.

Note: ignore access issues, geographic features, geology and hydrology issues.

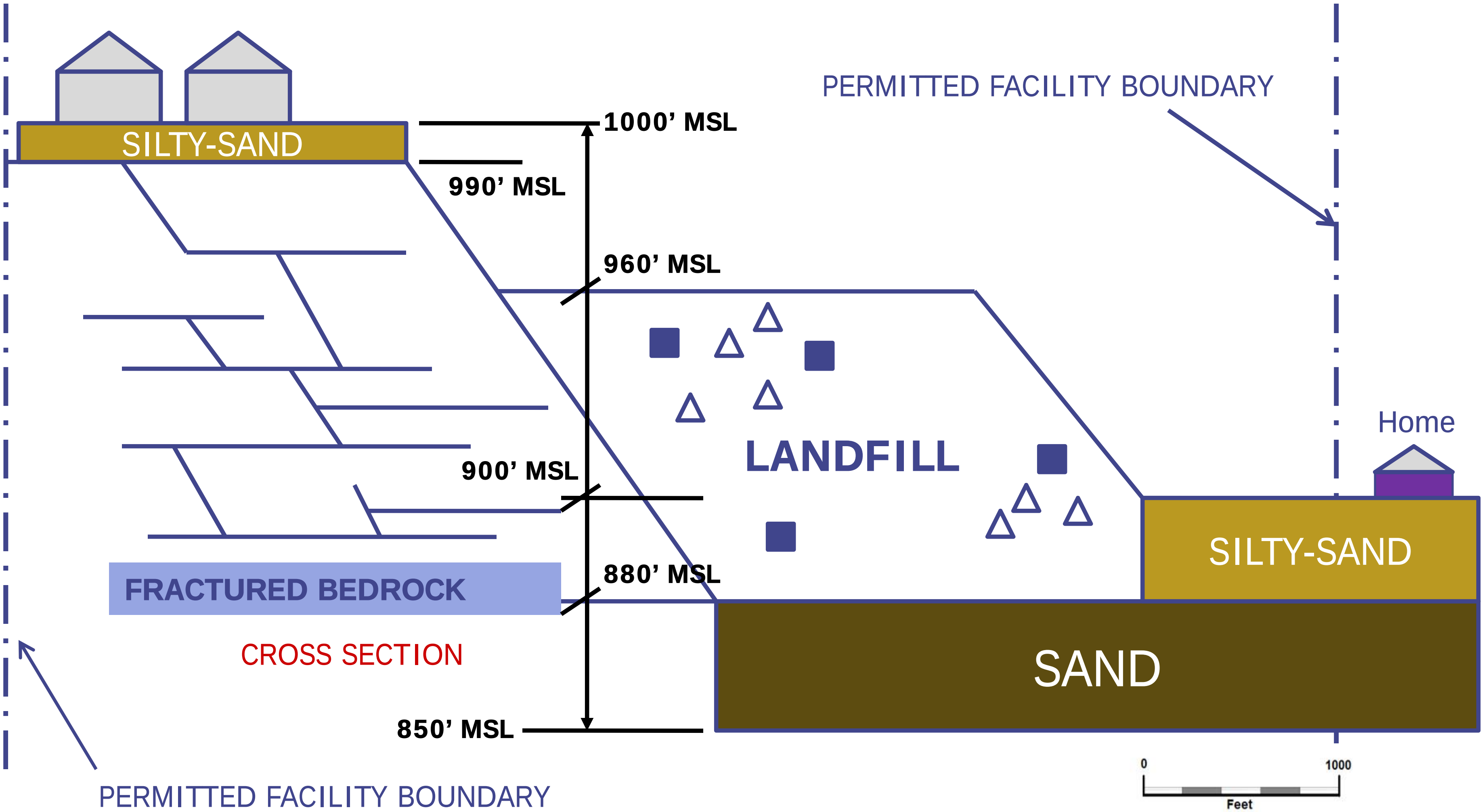
Exercise 3A: Geologic Issues--Well Location (Bedrock and Structures)



The above cross-section shows various soil types surrounding a landfill with bedrock at the bottom of the landfill. Structures exist above fractured bedrock within the permitted facility boundary and a house is located above a silty-sand layer outside the permitted facility boundary. The depth of the waste is at 880’ mean sea level (MSL) . The structures are at 1000’ MSL and the house is at 900’ MSL.

EXERCISE: Show LFG migration routes with arrows. Show locations of monitoring wells and depth of probes considering 1) structures and 2) geologic conditions.

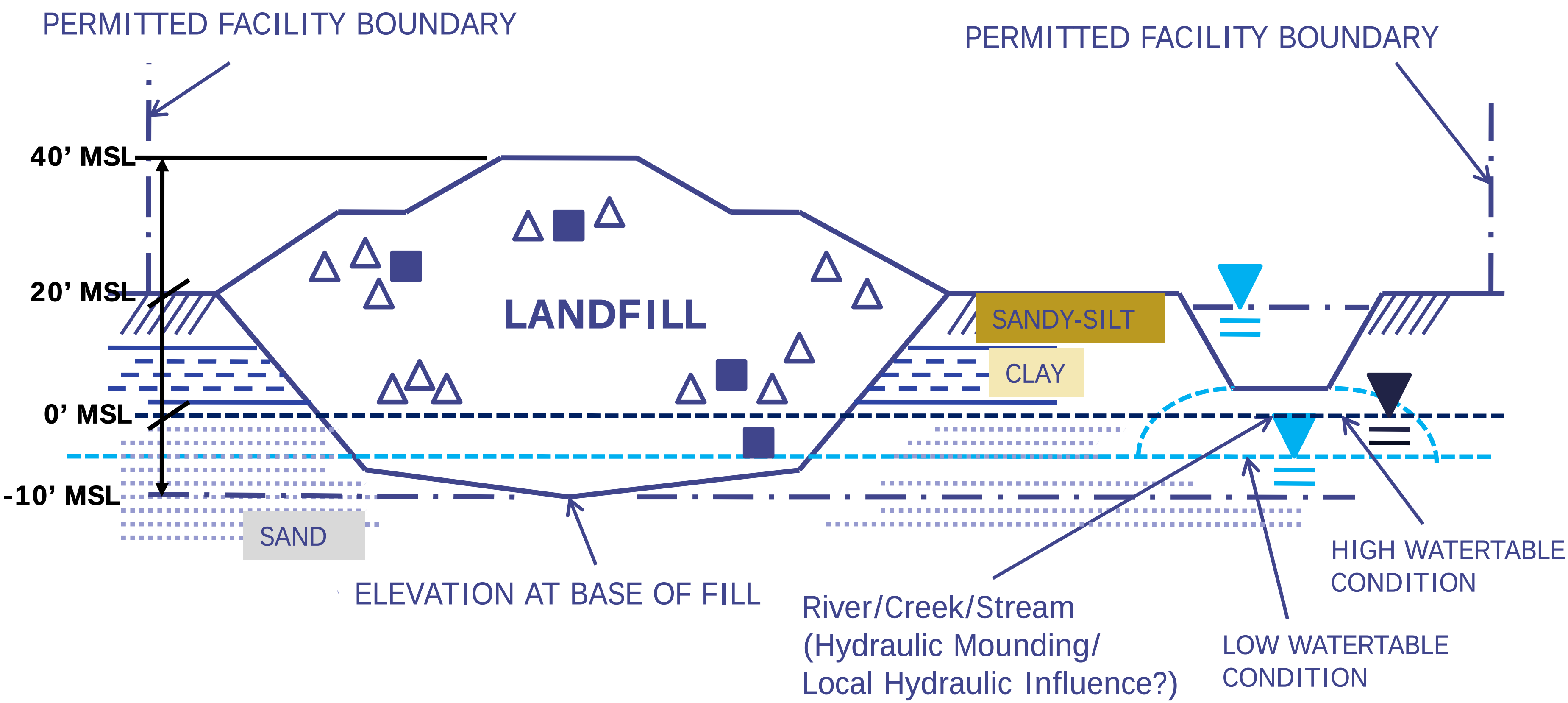
Exercise 3B: Geologic Issues--Well Location (Sand and Structures)



The above cross-section shows various soil types surrounding a landfill with sand at the bottom of the landfill. Structures exist above fractured bedrock within the permitted facility boundary and a house is located above a silty-sand layer outside the permitted facility boundary. The depth of the waste is at 880’ mean sea level (MSL) . The structures are at 1000’ MSL, and the house is at 900’ MSL.

EXERCISE: Show LFG migration routes with arrows. Show locations of monitoring wells and depth of probes considering 1) structures and 2) geologic conditions.

Exercise 4A: Hydrologic Issues—Seasonal Water Fluctuation (Permanent Stream)

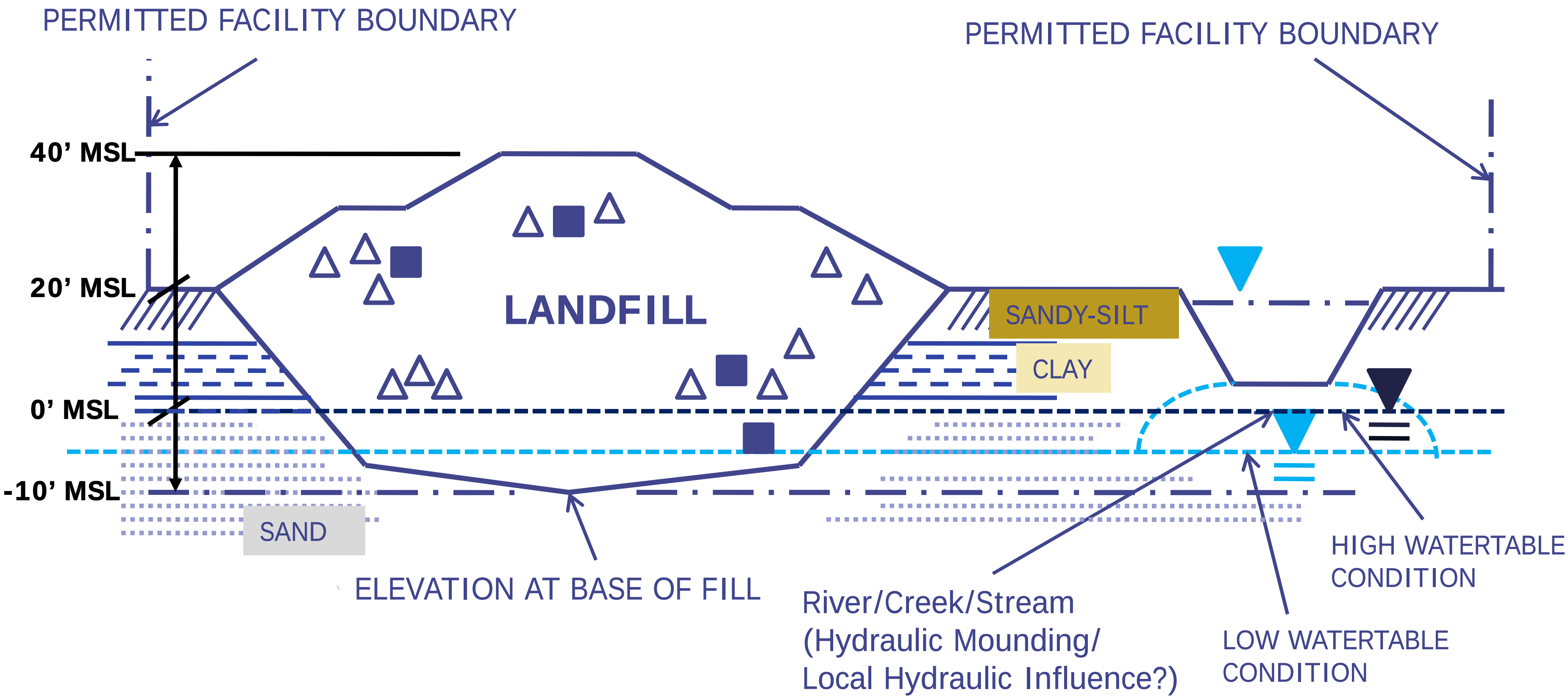


The above cross-section shows a permanent stream above the low and high water tables adjacent to a landfill. The permanent stream could act as a potential barrier for landfill gas migration. The depth of the waste is at -10 mean sea level (MSL) and the high water table is at 0' MSL.

EXERCISE: 1) Show LFG migration route.2) Design a LFG monitoring system consistent with state standards. Show locations and depth of monitoring wells at both permitted boundaries. How does the water table impact system design? What documentation would be needed?

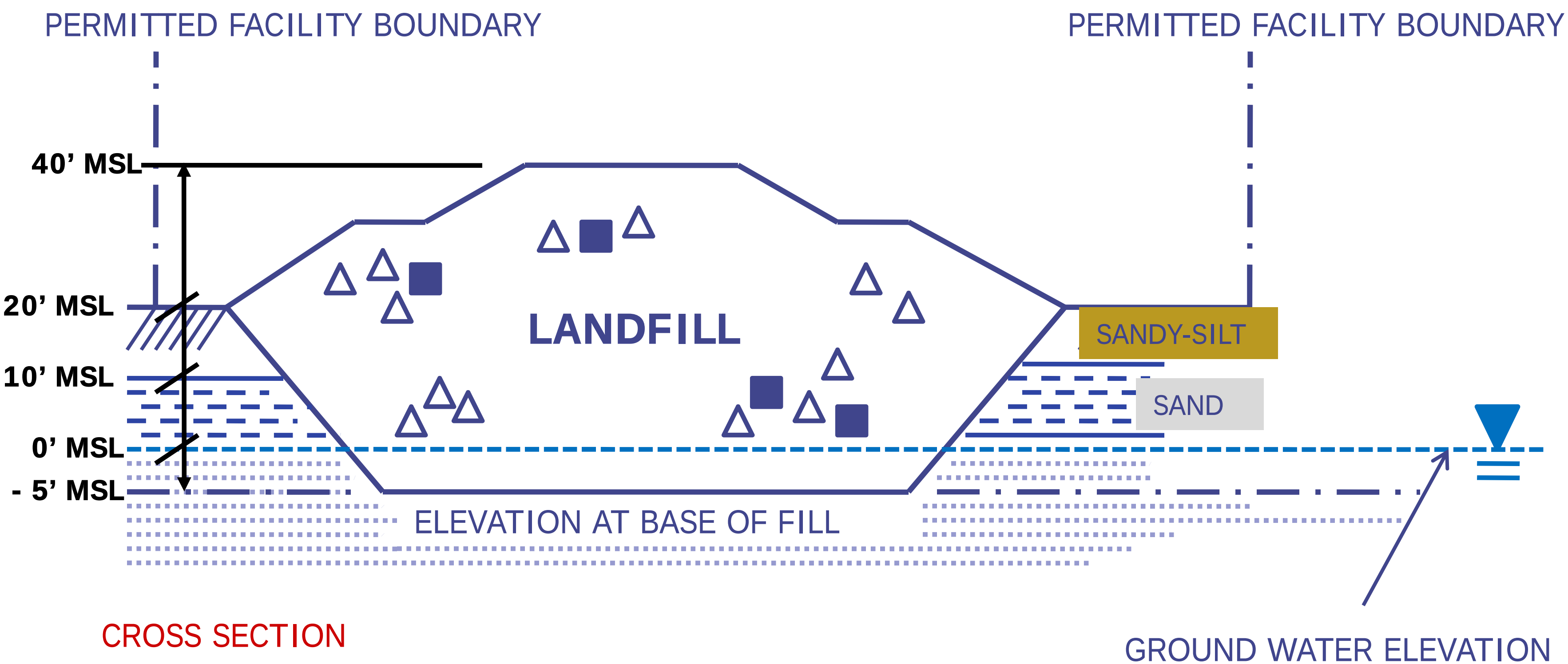
Exercise 4B: Hydrologic Issues—Seasonal Water Fluctuation (Intermittent Stream)

Assumption regarding details relative to surface & groundwater relative to barriers.



The above cross-section shows an intermittent stream above the low and high water tables adjacent to a landfill. The intermittent stream could allow landfill gas to migrate. The depth of the waste is at -10 mean sea level (MSL) and the high water table is at 0' MSL.

Exercise 5: Hydrologic Issues--Depth of Waste vs. Groundwater level



The above cross-section shows a landfill where the depth of the waste is below the ground water level. The depth of the waste is at -5' mean seal level (MSL) and the top of the landfill is at 40' MSL.

EXERCISE: 1) Show routes of LFG migration with arrows. 2) Design a LFG monitoring system consistent with state standards. Show locations and depth of monitoring wells Discuss influence of depth of waste and groundwater elevation.